



UPDATE OF STOCK STATUS INDICATOR FOR NORTHERN SHRIMP IN THE ESTUARY AND GULF OF ST. LAWRENCE

Context

The stock assessment of Northern Shrimp (*Pandalus borealis*) in the Estuary and Gulf of St. Lawrence (EGSL) is conducted every two years, with the most recent assessment completed in January 2020. The precautionary approach adopted for this fishery demands an annual update of the stock status indicators. This indicator of stock status is calculated from the indices obtained from the summer commercial fishery and the Fisheries and Oceans Canada (DFO) research survey in August.

This Science Response Report results from the Science Response Process of January 29, 2021 on the updated indicator status of the northern shrimp stocks in the Estuary and Gulf of St. Lawrence.

Additional publications from this meeting will be posted on the [Fisheries and Oceans Canada \(DFO\) Science Advisory Schedule](#) as they become available.

Background

The Northern Shrimp fishery in the Gulf of St. Lawrence is conducted by trawlers in four shrimp fishing areas (SFA): Estuary (SFA 12), Sept-Iles (SFA 10), Anticosti (SFA 9) and Esquiman (SFA 8).

Shrimp fishing is regulated by a number of management measures, including the setting of total allowable catches (TAC) in the four areas. TAC-based management limits fishing in order to protect the reproductive potential of the population. The essential elements for the establishment of a precautionary approach were adopted in 2012. Reference points were determined and harvest guidelines were established based on the main indicator and its position in relation to the stock status classification zones (healthy, cautious and critical).

Description of the Fishery

Following the last assessment, the 2020 TACs were increased by 154% in the Estuary and by 20% in Sept-Iles. The TAC was reduced by 8% in Anticosti and it remained unchanged in Esquiman. These variations represent a total increase of 4% for the EGSL. For the four stocks, preliminary landings for 2020 was 17,881 tons (t), or more than 99% to the TAC (17,999 t) (Figure 1). The total fishing effort in the EGSL has decreased by 7% in 2020 to total approximately 70,000 fishing hours.

Quebec Region

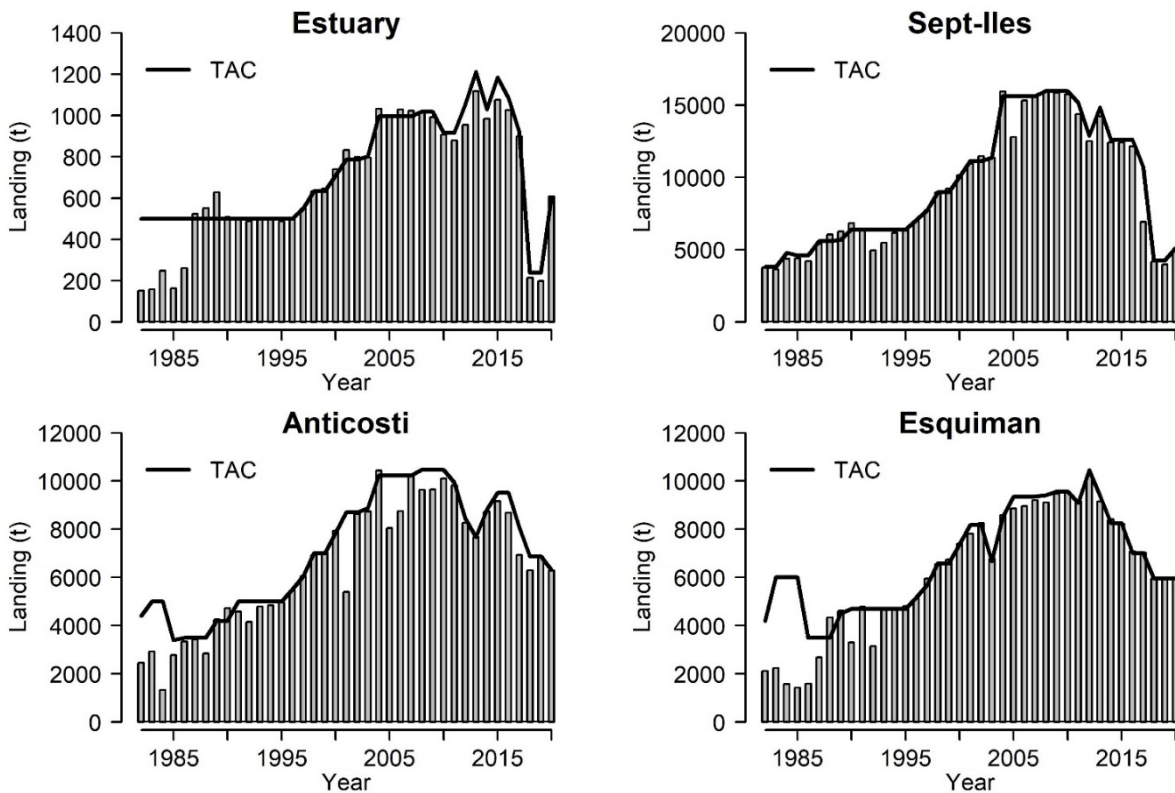


Figure 1. Landings and total allowable catch (TAC) by fishing area and by year. The 2020 landings data are preliminary on date of December 21, 2020.

Analysis and Response

Abundance indices

The update of the main stock status indicator is based on two independent sources of data, the number of shrimp per unit of effort (NPUE) from the summer commercial fishery (June, July and August) and the index of shrimp abundance from the DFO research survey in August. From these two sources of data, indices for male and female components are estimated, for a total of four indices by fishing area. In order to combine them into one indicator, each index is standardized in relation to a reference period.

The abundance indices of males and females from the research survey in Estuary are highly variable, they decreased significantly in 2020 and compare with the low values observed in 2017 and 2018 (Figure 2). The abundances of males and females in Sept-Iles and Anticosti increased slightly in 2020, but still remain at low levels. Downward trends continue in Esquiman for both males and females and the 2020 estimates compare to the low values observed in the early 1990s.

The commercial fishery indices for males and females in Estuary are relatively stable at high values (Figure 2). In Sept-Iles, Anticosti and Esquiman, the fishing indices have been increasing for two years, but still remain lower than the high values observed from 2005 to 2015.

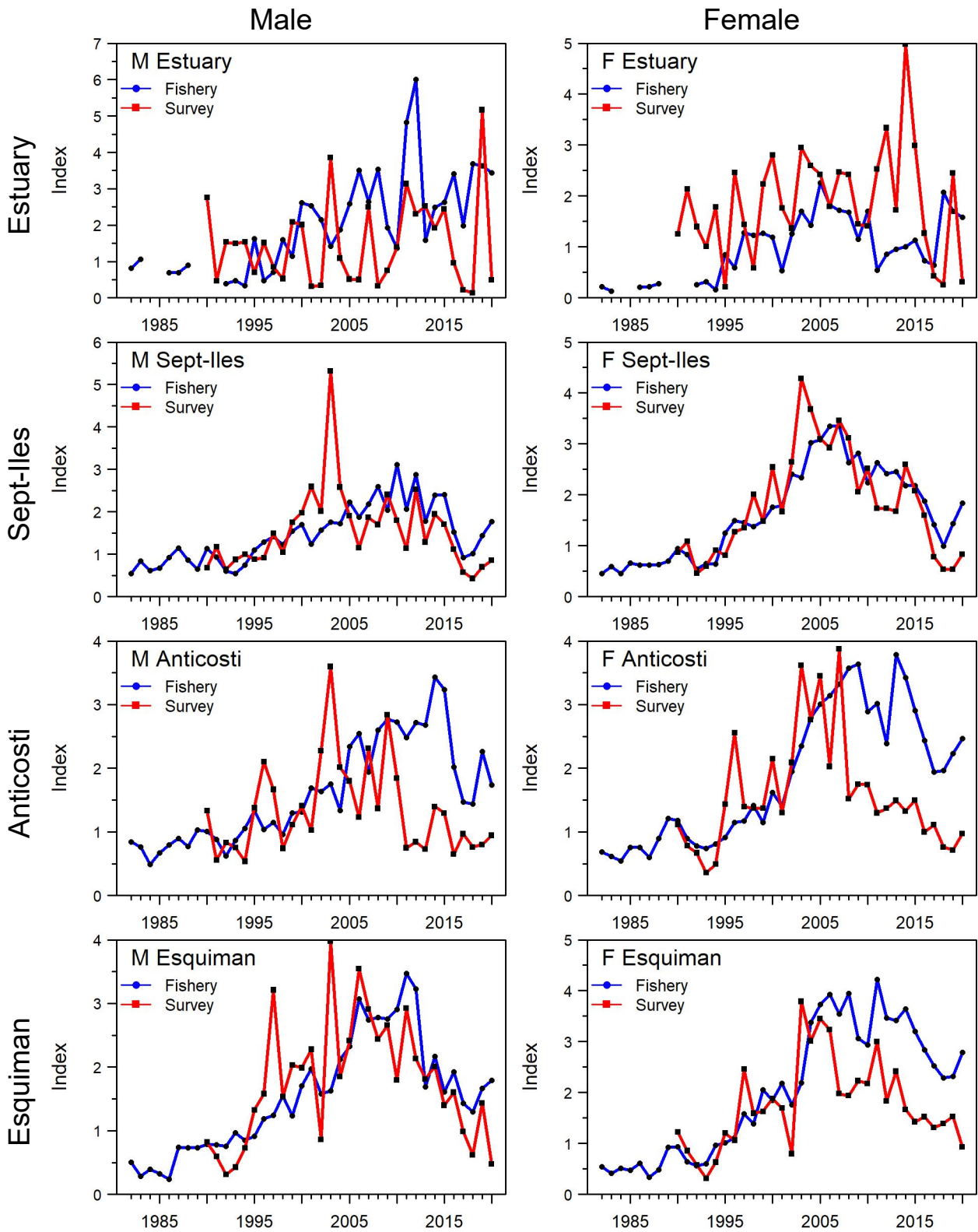


Figure 2. Standardized indices from the commercial fishery (blue) and the research survey (red) for males (M) and females (F) by fishing area and year.

Quebec Region

Main stock status indicator

For each stock, the main stock status indicator represents the mean of the four indices, the males and females obtained from the summer commercial fishery and the DFO research survey.

The main stock status indicator for Estuary declined sharply in 2020 following a strong increase observed in 2019. It compares to the value observed in 2018 and remains in the healthy zone (Figure 3). The indicator for Sept-Iles continues to improve for a second consecutive year and is still in the caution zone near the upper reference point. The Anticosti and Esquiman stocks have been in the healthy zone for about 20 years and their indicator has been relatively stable for four or five years, near the upper reference point.

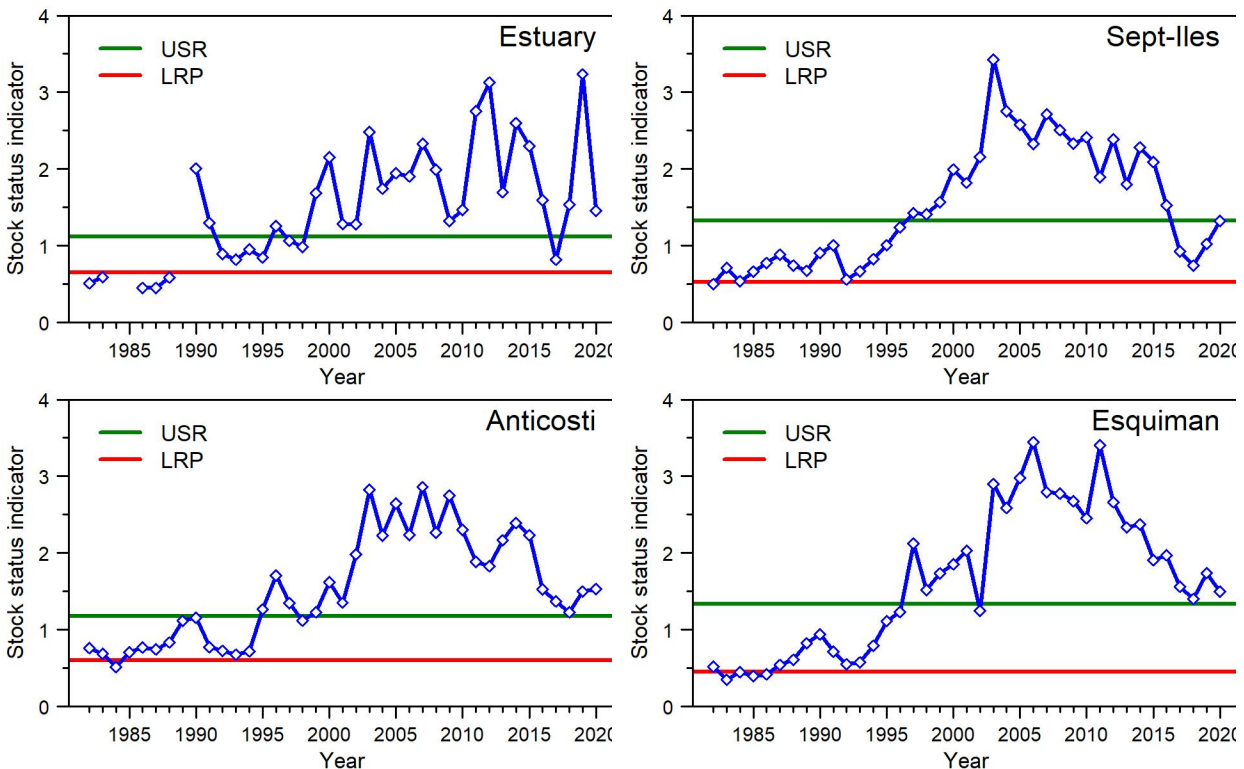


Figure 3. Main stock status indicator by year and limit (LRP) and upper (USR) stock reference points for each fishing area.

Conclusions

Some of the unfavorable ecosystem conditions for northern shrimp in the Gulf of St. Lawrence have not improved in 2020. Deep waters have continued to warm and redfish abundances are still very high. Despite this, there is a slowdown in the decline or a slight improvement in the main stock status indicator northern shrimp stocks.

The analysis of the main stock status indicator shows that three of the stocks in the Gulf of St. Lawrence are in the healthy zone, namely the Estuary, Anticosti and Esquiman stocks. The fourth stock, Sept-Iles, is in the cautious zone and its situation has been improving for two years. Its main indicator is now very close to the healthy zone.

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Sources of Information

This Science Response Report results from the Science Response Process of January 29, 2021 on the updated indicator status of the northern shrimp stocks in the Estuary and Gulf of St. Lawrence.

Additional publications from this process will be posted on the [DFO Science Advisory Schedule](#) as they become available.

Bourdages, H., Marquis, M.C., Ouellette-Plante, J., Chabot, D., Galbraith, P., and Isabel, L. 2020. [Assessment of northern shrimp stocks in the Estuary and Gulf of St. Lawrence in 2019: commercial fishery and research survey data](#). DFO Can. Sci. Advis. Sec. Res. Doc. 2020/012. xiii + 155 p.

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